

Visual 3D display

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Abstract

A visual display is formed by picture elements, which are optically coupled to optical pathways through which light is supplied from light sources. Light sources, controlled by control hardware, transmit light to the optical pathways by scanning light from the light sources to different optical pathways. The light sources and the optical pathways are mutually oriented so that light from the light sources can be camed to different optical pathways to form the displayed image. Light sources can be mounted to a rotating mounting that rotates past static pathways that transmit coupled light to the waveguide screen.

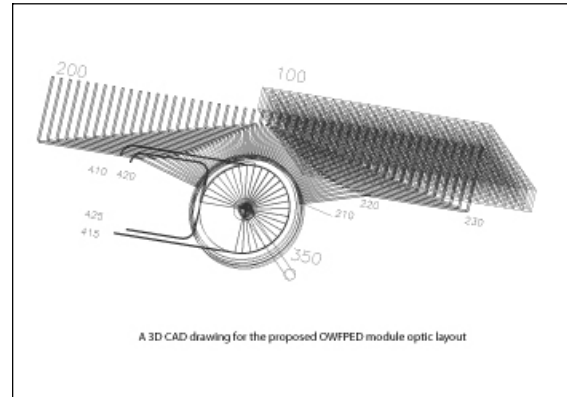
1. Objectives and Background

Background:

LCD & PDP are both panel based display technology currently dominate 32 to 50 inches market. There is also temptation from manufacturers to enter much larger panel based display screens, which requires huge capital investment. These technologies are highly unlikely to take human vision into 3D perspective era.

Objective:

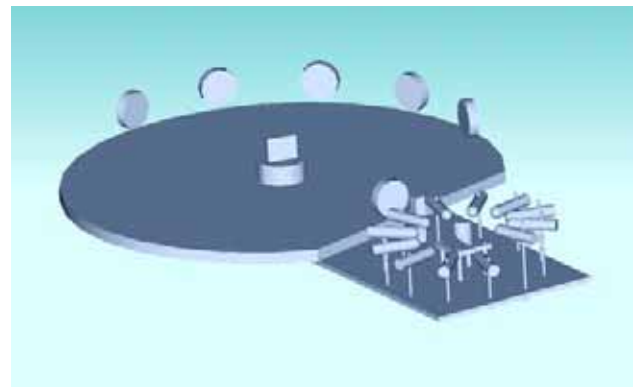
OWFPED invention utilizes simple optical reflection and refraction solutions to design visual light propagation paths (optical waveguide) within a thin panel. These paths effectively transfer circumferential Laser scan into linear raster scan, which maintains the profile of laser beam section while its vectors will be controlled by electronic control system so that arbitrary color pixel display or autostereoscopic of unrestricted viewing positions can be tracked. The first objective of this invention is to produce border-free screen modules, which overcomes the manufacturing risks associating with conventional flat panels' production methods that require huge investment but limited screen sizes and formats. The second objective of this invention is to develop auto stereoscopic display products.



2. Results

At this point, patent document has been published by WIPO and an International Search Report was established by IPAustralia. Preliminary Examination Request was also filed recently.

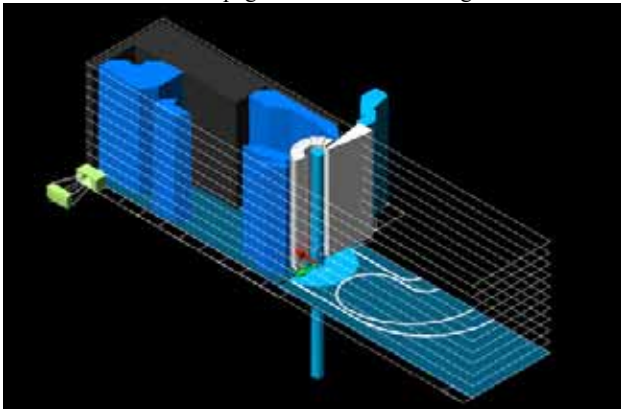
At the moment we endeavor to finish current prototype as a way to demonstrate the underline principles of OWFPED technology. This prototype can be illustrated as following CAD drawing and photo of partly finished assembly.





Meanwhile, CAD designing is underway for the next prototype optical system, which has vast improvement of waveguide channels integration. We believe this design is closer toward commercial products that are ready for mass production.

Please refer to the next page for the CAD drawing.



As an edge-free module based screen technology, the revolutionary impacts to current large area display are:

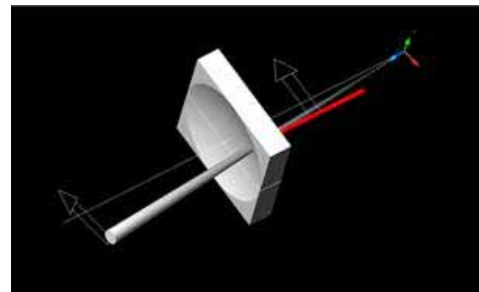
3. Impact

1. There are no fixed display ratios, formats and screen sizes in this invention. It can be assembled as necessary or be disassembled for easy transportation. The risk for manufacturers in capital investment will be greatly reduced. Current LCD Gen 7 Fab requires up to 4 billions US dollars investment. In 10 to 15 years, LCD and PDP will not be commercially viable when this invention is fully commercialized. Currently, forecast for worldwide market demand on large area flat panel (40 to 50 inches wide screen formats) products is over 18 millions sets, which makes in value terms of more than 20 billions dollars of sales. This figure does not reflect the potential demand of OWFPED products in application of portrait styles or other than wide screen format (16:9) landscape styles. More importantly, auto-stereoscopic display will be very attractive to high end users such as commercial application, military applications, medical

applications, educational applications, etc. Also tens of thousands of cinema screens worldwide might also be the potential targets. In the 50s and 60s of 20th century, cinema screens had to adopt wide screen format to lure people from television program back to movie theatres. In the coming impact of OWFPED 3D technology, we believe this will be the only choice for them to upgrade their screen into 3D venue because they have to offer such feature to attract audiences and stay in business.

2. OWFPED modules is purely optical system while electronic system and light sources can be replaced, which compares with most direct view panel, it will be rugged for many high-end-users applications and reliable. For instance, replacing a (or a few) module can fix the whole screen due to the fact that every module works independently.

3. OWFPED 3D relies on Spatial Oscillation Scan (SOS) to overcome designing and manufacturing challenge in high resolution and 3D



display (Autostereoscopic). This technology will offer the possibility in application such as privacy display function, multiple & simultaneously 3D display of various contents in one panel, fully concealed 3D display venue, interactive dactylogy command (or gesture recognition interface as see in the movie "minority report") between viewers and OWFPED 3D panel etc. There are many important influences to the life of the future. For example, family with a OWFPED 3D display panel will no longer have the problem in choosing which television program to watch, parent will have the right to select programs and time to control how and when their children can watch the television, of which its interactive function can intelligently identify a child by its SOS system. Cinema venues in the future can be opened for business 24/7/365 for people who can access any digitized 3D movies. These cinemas might not necessarily screen movies according to time-table. Off course, people might have to wear earphone to listen to your movie script. It also makes sense that Jim Carry's comedy movies should not be shown in the same venue with Russell Crowe's "Cinderella Man". **Further more, interactive function in the future movies making and electronic games development might create opportunity for audiences to participate movie story lines to certain extent, especially for an action movie.** Interactive display based on OWFPED 3D concept will increase the level of security than any of the 2D display products. Security enhancement will be unprecedented by the display privacy user interface, which conventional display will not have proper concealment of privacy information in the public domain. Fixed pattern or location of information input method can also a target of interception, which is well known in many cases of criminal acts. In this invention, virtual input command interface can be random located within user's 3D perception or customized by users. Multi-layers of security check, even to the degree of users' facial appearance character verification will also be the options for security enhancement.

4. This technology will be environment friendly and energy saving due to the design approach and lifetime expectation of optical engineering structure.

5. There will be conceptual change of manufacturing of large area display and products marketing relationship due to this invention has completely release producers from the supply and demand circle. Nevertheless huge demand for OWFPED modules in global scale and low entry requirement for manufacturers also means current flat panel manufacturers must reconsider their positions as the opportunities and threat this invention is about to bringing in a few years of time. There will also fundamental challenge in many aspects relating to display technologies and contents providers as this invention will create issues that not many people have yet to consider.

4. Acknowledgements

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